WG#3 - Neutrino Interactions Session

Preliminary List of Bullets

1) The Neutrino-Nucleus Interaction is the least understood component of a detector's response to neutrinos**.**

2) Improvements of nuclear models by nuclear theorists are essential. This can most efficiently be accomplished with additional financial support of NP theorists. Rapidly incorporating these improvements in event generators is equally important and requires a collaborative effort of the HEP and NP communities.

3) The current experimental neutrino interaction program (MINERvA, NOvA-ND, MicroBooNE, T2K Near Detector) continues to provide important data and should be supported to its conclusion. This includes efforts to improve the precision with which the neutrino flux is known.

4) The critical role of neutrino nucleus event generators needs to be emphasized and more community resources devoted to keeping them widely available, accurate, transparent, and current. It is critical to benchmark the generators against both accelerator-based neutrino-nucleus interaction measurements and, via a collaborative HEP and NP effort, electron-nucleus interaction measurements. For example, expanded use of the existing Jefferson Laboratory data set could bring significant insight.

5) Future neutrino interaction measurements are needed to extend the current program of GeV-scale neutrino interactions. The feasibility of a high-statistics deuterium experiment should be considered. Current and future long-and-short-baseline neutrino oscillation programs should evaluate what additional neutrino nucleus interaction data is required to meet their ambitious goals and support experiments that provide this data.

6) Measurements and theoretical work are needed also to characterize neutrino interactions in the low energy regime (<100 MeV). This regime is especially relevant for core-collapse supernova neutrinos, and understanding is essential for development of future underground detectors. This is also an area for which collaboration with NP will bring in critical expertise.